

REMARKS

I. STATUS OF THE CLAIMS

Claims 1-21 are currently pending. Applicant has amended claim 1 by (i) deleting reference to "semi-continuous" and (ii) adding the recitation "single-pass" thereto. Applicant submits that this amendment is supported by the specification, for example, at pages 5-7 and Figure 1. Hence, Applicant further submits no new matter has been added by these amendments. *In re Johnson*, 194 U.S.P.Q. 187 (C.C.P.A. 1977).

II. INTERVIEW

Applicant thanks the Examiner for his time to discuss the pending claims and prior art. In view of this discussion, Applicant amended the claims to exclude processing equipment that is inconsistent with a continuous process using a single-pass channel. For example, as explained by the specification, such a single-pass process precludes the use of recycle piping. Accordingly, the claims encompass processes that continuously produce precipitated calcium carbonate in a single-pass channel. The fact that the processing equipment may be shutdown or must go through some start-up procedure does not detract from whether the process is continuous when operating.

III. SECTION 103(a) REJECTIONS

(A) The Office has rejected claims 1-12 under 35 U.S.C. § 103(a) as unpatentable over Kosin et al. (U.S. Patent No. 4,888,160) for the reasons disclosed at pages 2 through 4 of the Office Action. Applicant respectfully traverses this rejection for at least the reasons presented below.

The claimed invention, as recited in e.g., amended claim 1, is directed to a method of continuously producing a product comprising precipitated calcium carbonate. The method comprises continuously delivering an aqueous suspension of a calcium ion source and carbon dioxide into a single-pass channel, and then continuously extracting from the channel precipitated calcium carbonate suspended in an aqueous medium, produced by reaction of the calcium ion source and carbon dioxide in the channel.

In contrast, Kosin et al. teaches a batch process for producing precipitated calcium carbonate comprising injecting a gas containing carbon dioxide into a recycle system, which is in communication with a reaction vessel. The carbon dioxide containing gas is introduced at a turbulent point or area in the recycle system, which may contain in-line mixers. '160 patent at col. 2, lines 43-49 & col. 3, lines 41-50. The slurry is repeatedly recirculated through the recycle system until a given pH is reached. *Id.* at col. 4, lines 17-25. The precipitated calcium carbonate is removed after being digested and agitated in the reaction vessel. *Id.* at col. 4, lines 42-48.

Applicant's invention is not obvious over Kosin et al. As an initial matter, a *prima facie* case of obviousness requires three basic criteria to be met. M.P.E.P. § 2142. First, the Office must establish that Kosin et al. teaches or suggests all the claim limitations. See M.P.E.P. § 2143.03. Second, the Office must establish that some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, exists to modify the reference. See M.P.E.P. § 2143.01. Finally, the Office must establish a reasonable expectation of success from the required modification. See M.P.E.P. § 2143.02. In the present case,

at a minimum, Kosin et al. does not teach or suggest all the claim limitations nor is there a suggestion or motivation in the art to modify the teachings of Kosin et al.

The Office asserts that it would have been obvious to a person of ordinary skill in the art to make Kosin et al. a continuous process that meets the elements of the claims. Office Action at 3. Applicants respectfully disagree. While a continuous process may be obtained by adding a continuous addition and continuous removal of materials, as per In re Dilnot, 138 U.S.P.Q. 248 (C.C.P.A. 1963), the resultant process still does not render the claimed invention obvious.

First, Kosin et al., even when modified as per In re Dilnot, does not teach or suggest a continuous process with a single-pass channel. Kosin et al. expressly teaches and requires the use of recycle system, wherein material is pumped through the recycle system more than once until a pH level is reached. '160 patent at col. 2, lines 43-49, col. 3, lines 41-50, & col. 4, lines 17-25. Applicant's specification at page 7 expressly explains that the use of recycle piping is inconsistent with Applicant's process. Further, the need to continuously pump material through the system until a given pH is reached is inconsistent with the single-pass requirement.

Second, while Kosin et al. discloses that carbon dioxide and calcium hydroxide meet in the recycle system, Kosin et al. does not teach that the precipitated calcium carbonate is continuously extracting from a channel. Specifically, Kosin et al. teaches that the mixing in the reaction vessel is necessary to maintain homogeneity (col. 3, lines 30-32) and that this mixing is necessary even after introduction of the carbon dioxide has been discontinued (col. 4, lines 45-48 & 65-66). See *also*, Skuse Declaration at ¶6.

Hence, the precipitated calcium carbonate is extracted from the batch process, the reaction vessel, at a later time.

As Kosin et al. does not teach the claimed method, the Office is obligated to establish a motivation to modify the teachings of Kosin et al. to achieve Applicant's claimed process. See M.P.E.P. §2143.01. It is well established that a motivation to modify the prior art must be present and must flow from some teaching in the art that suggests the desirability or incentive to make the modification needed to arrive at the claimed invention. See, e.g., *In re Napier*, 34 U.S.P.Q.2d 1782, 1784 (Fed. Cir. 1995). Further, the Office must provide factual evidence of why one skilled in the art would be motivated to further modify the teachings of Kosin et al. See *In re Zurko*, 59 U.S.P.Q.2d 1693, 1697 (Fed. Cir. 2001) ("With respect to core factual findings in a determination of patentability, . . . the Board cannot simply reach conclusions based on its own understanding or expertise . . . Rather, the Board must point to some concrete evidence in the record in support of these findings.") It is simply not enough for the Office to provide an opinion. *Id.*

Applicant submits that one skilled in the art reading Kosin et al. in view of In re Dilnot would not design a continuous process that renders the claims obvious. The Examiner's attention is respectfully directed to M.P.E.P. § 2143.01 and well-known Court decisions holding that if a proposal for modifying the prior art in an effort to attain the claimed invention causes the art to become inoperable or destroys its intended function, then the requisite motivation to make the modification would not have existed. See, *In re Fritch*, 23 U.S.P.Q.2d 1780, 1783 (Fed. Cir. 1992); *In re Ratti*, 123 U.S.P.Q. 349, 352 (C.C.P.A. 1959) (holding the suggested combination of references improper

under section 103 because it "would require a substantial reconstruction and redesign of the elements shown in [a prior art reference] as well as a change in the basic principles under which [that reference's] construction was designed to operate.").

As noted above, Kosin et al.'s process utilizes a closed stirred tank reactor with a recycle line, which is directly inapposite to the claimed continuous process with single-pass channel. '160 patent at Examples 1-6 & Figure 1; Declaration of D. Skuse at ¶¶6. Kosin et al. teaches the necessity of a holding tank, even after the carbon dioxide is no longer being added to carry out the reaction in the tank. '160 patent at col. 4, lines 45-48; Declaration of D. Skuse at ¶¶6. Finally, Kosin et al. discusses the necessity of the recycle line. '160 patent at col. 5, lines 30-37 & Examples 1-6; Declaration of D. Skuse at ¶¶7. Accordingly, in view of these and other disclosures by Kosin et al., one of ordinary skill in the art may envision a continuous process that maintains the use of at least one recycle line and at least one holding tank. Declaration of D. Skuse at ¶¶8. One of ordinary skill in the art with the teachings of Kosin et al. before him would not envision a single-pass channel, as claimed by Applicant, wherein reactants enter and the product leaves on a continuous basis. *See Id.* at ¶¶9.

As the C.C.P.A. has noted "[i]t is impermissible within the framework of section 103 to pick and choose from any one reference only so much of it as will support a given position, to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests to one of ordinary skill in the art." *In re Wesslau*, 147 U.S.P.Q. 391, 393 (C.C.P.A. 1965). Applicant submits that the Office cannot ignore Kosin et al.'s requirement for a recycle line and a reaction vessel. *See* Declaration of D. Skuse at ¶¶6-7.

Since Kosin et al. does not teach or suggest a continuous process as claimed, a *prima facie* case of obviousness has not been established. M.P.E.P. § 2142.

Accordingly, the rejection under Section 103 has been overcome and Applicant respectfully requests it be withdrawn.

(B) The Examiner has rejected claims 13-21 under 35 U.S.C. § 103(a) as unpatentable over Kosin et al. in view of Bleakley I (EP 0 604 095) for the reasons disclosed at pages 4 through 5 of the Office Action. Applicant respectfully traverses this rejection.

The only difference between this rejection and the previous rejection is the Office's reliance on Bleakley I to provide the alleged motivation to modify the processes of Kosin et al. to include non-consumable solids. Office Action at 4-5. Accordingly, Applicant respectfully traverses this rejection for the reasons set forth above with regard to rejection (A) and incorporates them fully herein by reference. Moreover, the secondary reference, Bleakley I, does not correct the deficiencies of Kosin et al.

Since neither Kosin et al. nor the secondary reference, Bleakley I, teaches or suggests a continuous process as claimed, a *prima facie* case of obviousness has not been established. M.P.E.P. § 2142. Accordingly, the rejection under Section 103 has been overcome and Applicant respectfully requests it be withdrawn.

(C) The Examiner has rejected claims 1-12 under 35 U.S.C. § 103(a) as unpatentable over Ota et al. (U.S. Patent No. 4,824,654) in view of Bleakley II (U.S. Patent No. 5,342,600) alone or further in view of Kosin et al. for the reasons disclosed at pages 5 through 7 of the Office Action.

As discussed above, Applicant's invention, as recited in e.g., amended claim 1, comprises the continuous delivery of an aqueous suspension of a calcium ion source and carbon dioxide into a single-pass channel, and the subsequent continuous extracting from the channel precipitated calcium carbonate suspended in an aqueous medium, produced by reaction of the calcium ion source and carbon dioxide in the channel.

In contrast, the primary reference, Ota et al., is directed to a process of producing needle-shaped calcium carbonate, wherein the calcium hydroxide is in a solution, rather than in a suspension. Initially the calcium hydroxide is present in a solution at 0.04% to 0.17% by weight (col. 2, lines 50-54), before being further diluted. See '654 patent at col. 3, lines 15-19. As discussed by Applicant in the May 2003 Response, solution processes are not the same as slurry/suspension reactions. Specifically, Bunger et al. (previously cited by the Office) teaches at column 4, lines 7-9 that about 0.185% by weight is the maximum solubility for calcium hydroxide. Bunger et al. explains that there are significant differences between solution reactions and slurry/suspension reactions, including faster reaction times, better control of the reaction, and reduced energy consumption that can be achieved with a solution. Col. 3, line 45 - col. 4, line 65. Thus, the process suggested by the Office does not meet all of the limitations of the claims.

Moreover, Applicant submit there is no motivation to incorporate the teachings of Bleakley II and/or Kosin et al. First, in contrast to Ota et al., both references are directed to suspension/slurry reactions. See '600 patent at Abstract; see *also*, '160 patent at col. 4, lines 11-13. Second, both reference teach the use of high intensity mixing, which is wholly inconsistent with the formation of Ota et al.'s aragonite, needle

crystals (5-100 microns). '600 patent at col. 3, lines 11-37; '160 patent at col. 5, lines 1-29. In fact, both processes are designed to form smaller scalenohedral crystals (1-2 microns). '600 patent at col. 4, lines 1-5; '160 patent at col. 5, lines 1-29.

More importantly, the prior art teaches away from modifying the teachings of Ota et al. to use a suspension/slurry instead of the solution, particularly for a continuous process. As noted above, the prior art teaches that there are significant advantages to a solution process. In addition, Bunger et al. explicitly teaches that these advantages do not carry over to processes, like Applicant's channel. Col. 4, lines 54-58.

Accordingly, Applicant submits that there is no a motivation to combine references, no motivation to correct the deficiency of Ota et al., and an expectation of failure if the teachings of Ota et al. were corrected. Since Ota et al. does not teach or suggest a suspension process as claimed, and there is no motivation to correct this deficiency, a *prima facie* case of obviousness has not been established. M.P.E.P. §2142. Accordingly, the rejection under Section 103 has been overcome and Applicant respectfully requests it be withdrawn.

(D) The Examiner has rejected claims 13-21 under 35 U.S.C. § 103(a) as unpatentable over Ota et al. in view of Bleakley II either alone or further in view of Kosin, and further in view of Bleakley I for the reasons disclosed at pages 8 through 9 of the Office Action. Applicant respectfully traverses this rejection.

The only difference between this rejection and the previous rejection is the Office's reliance on Bleakley I to provide the alleged motivation to modify the processes of Ota et al. to include non-consumable solids. Office Action at 9. Accordingly, Applicant respectfully traverses this rejection for the reasons set forth above with regard

to rejection (C) and incorporates them fully herein by reference. Moreover, the secondary reference, Bleakley I, does not correct the deficiencies of Ota et al., Bleakley II, and Kosin et al.

Accordingly, the rejection under Section 103 has been overcome and Applicant respectfully requests it be withdrawn.

IV. CONCLUSION


In view of the foregoing amendments and remarks, Applicant respectfully requests reconsideration and reexamination of this application and the timely allowance of the pending claims.

Please grant any extensions of time required to enter this response and charge any additional required fees to our deposit account no. 06-0916.

Respectfully submitted,

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